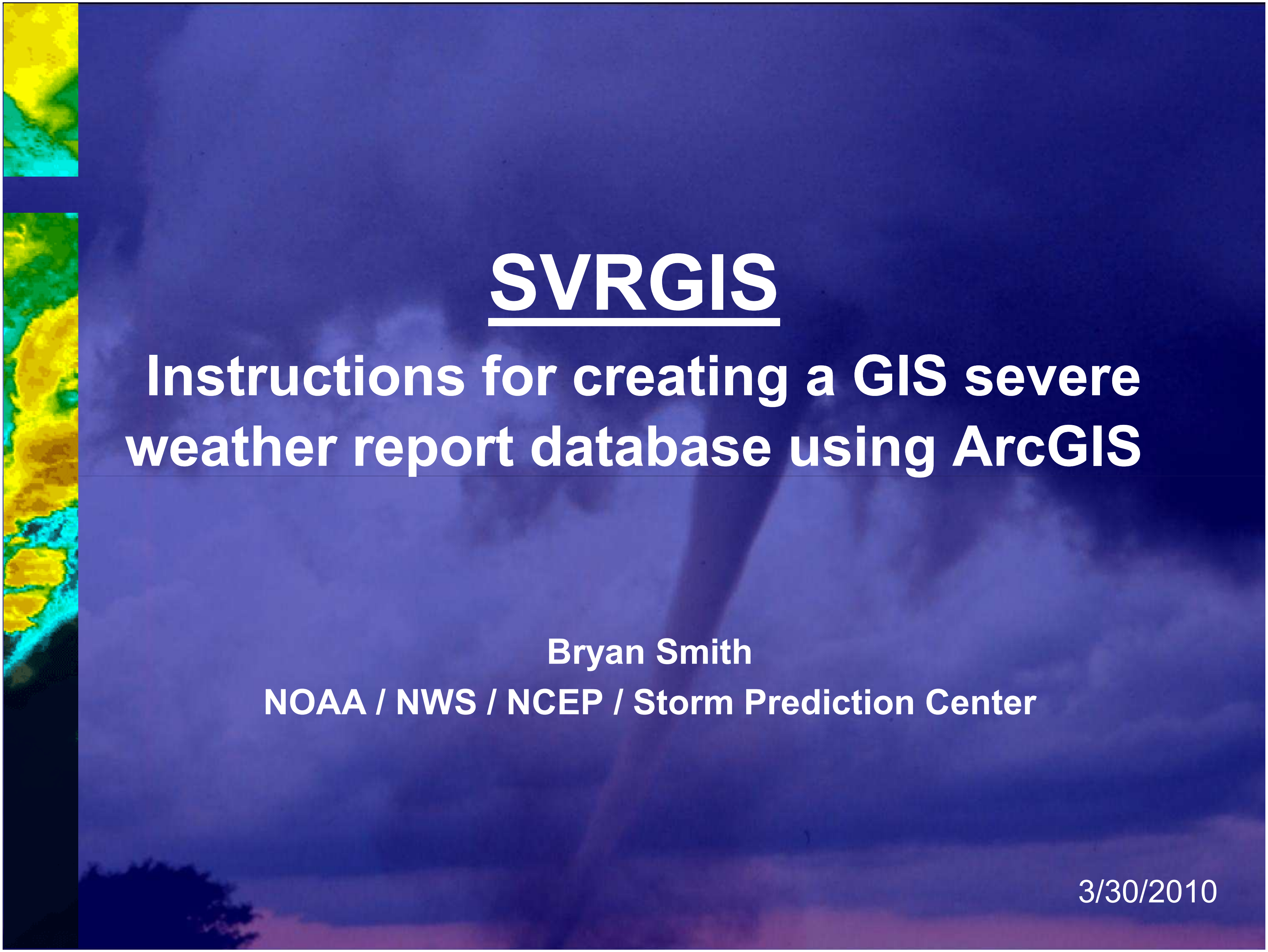


SVRGIS

Instructions for creating a GIS severe weather report database using ArcGIS

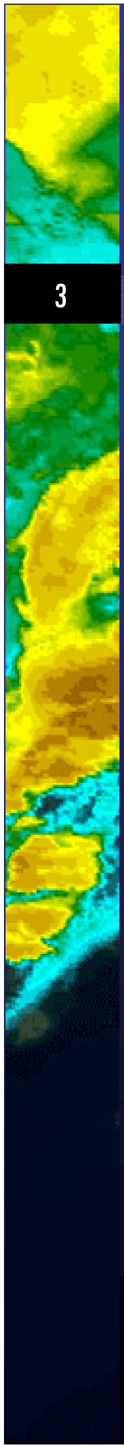
Bryan Smith
NOAA / NWS / NCEP / Storm Prediction Center

3/30/2010

Overview

- Below are instructions for creating and developing a geographic information systems (GIS) severe weather report database using ArcGIS's ArcMap software. Included in this manual are specific instructions for importing the SVRGIS data into the ArcMap program, as well as different methods to query, sort, or select the data based on user needs. These step-by-step instructions are intended for someone with little or no experience with ArcGIS.

- The 2010 updated version of SVRGIS is available for download and includes data from 1950-2009.
  - *Note: Some of the file names and color displays are slightly different in the 2010 updated version of the .mxd file compared to the 2007 version.*
    - Every March/April, yearly updates to the database will be available to download. This is done after the data has been disseminated through NWS Headquarters and given a 3 month quality control period from the prior year.



Requirements

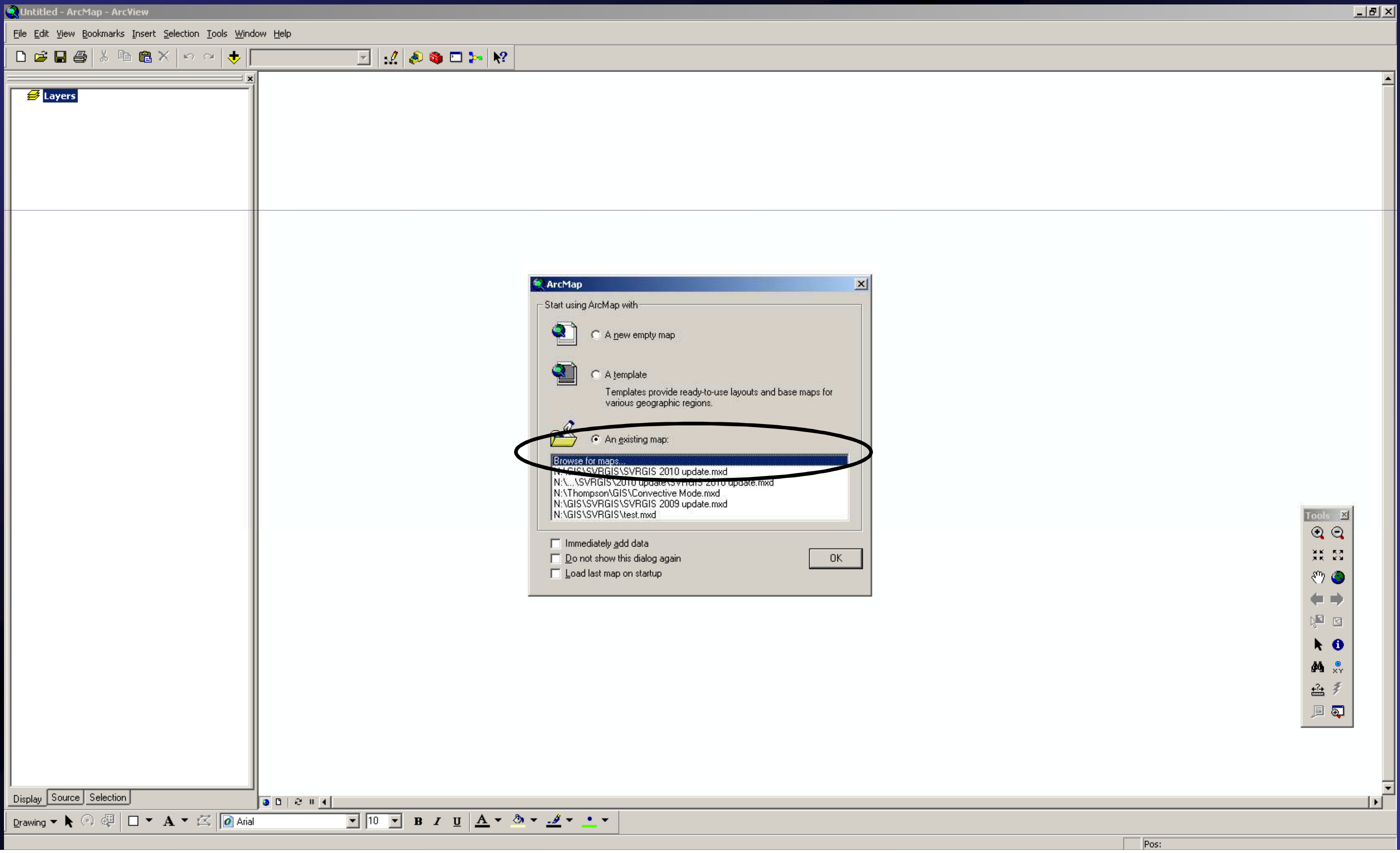
- **ArcGIS 9.3* ArcMap software viewing program.**
    - ***May use older versions of ArcGIS to examine data but specific methods of loading the SVRGIS database may differ slightly.**

Download files

- **All base files are linked and available for download at** http://www.spc.noaa.gov/gis/svrgis.
- **Download each zipped file and unzip it to a directory location of your choice (e.g., C:\Program Files\SVRGIS).**
- **Please note that the Cities.zip, topo-grey.zip, topo-brown.zip, and the topo-color.zip files are large (~25-50mb) and these will take time to download.**
- **When downloading has finished, please unzip each file to a directory location.**

Opening files in ArcMap

- **Open ArcMap by clicking on Start→All Programs→ArcGIS→ArcMap.**
- **Click on “An existing map” and then click “Browse for maps…” Click “OK.”**


Untitled - ArcMap - ArcView
File Edit View Bookmarks Insert Selection Tools Window Help
Layers
Tools
Display Source Selection
Drawing
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B I U
Pos:

ArcMap

Start using ArcMap with

○ A new empty map

○ A template

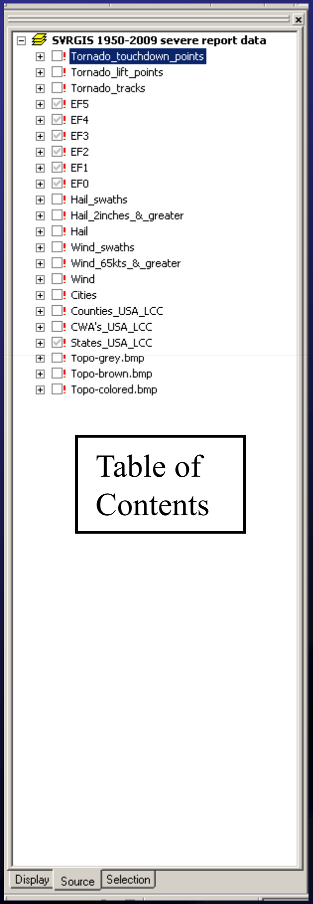
Templates provide ready-to-use layouts and base maps for various geographic regions.

● An existing map:

Browse for maps...
N:\GIS\SVRGIS\SVRGIS 2010 update.mxd
N:\...\SVRGIS\2010 update\SVRGIS 2010 update.mxd
N:\Thompson\GIS\Convective Mode.mxd
N:\GIS\SVRGIS\SVRGIS 2009 update.mxd
N:\GIS\SVRGIS\test.mxd

☐ Immediately add data
☐ Do not show this dialog again
☐ Load last map on startup

OK

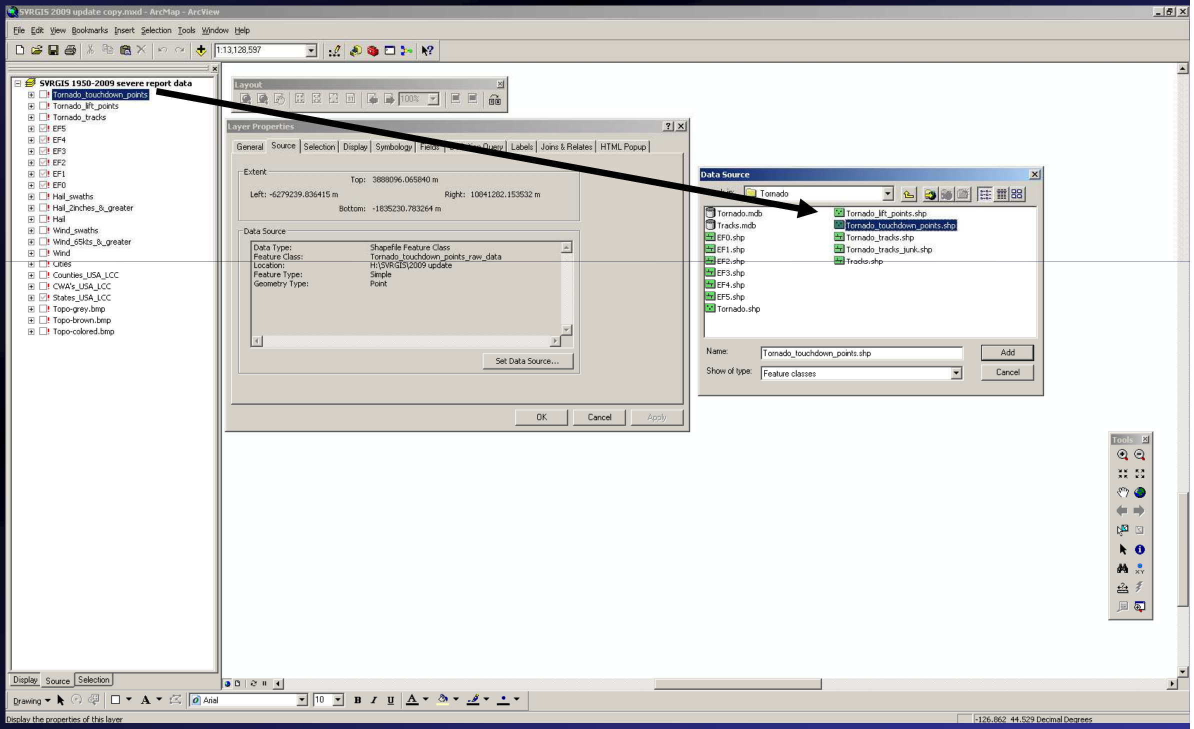


- SVRGIS 1950-2009 severe report data
  - ☐ ! Tornado_touchdown_points
  - ☐ ! Tornado_lift_points
  - ☐ ! Tornado_tracks
  - ☑ ! EF5
  - ☑ ! EF4
  - ☑ ! EF3
  - ☑ ! EF2
  - ☑ ! EF1
  - ☑ ! EF0
  - ☐ ! Hail_swaths
  - ☐ ! Hail_2inches_&_greater
  - ☐ ! Hail
  - ☐ ! Wind_swaths
  - ☐ ! Wind_65kts_&_greater
  - ☐ ! Wind
  - ☐ ! Cities
  - ☐ ! Counties_USA_LCC
  - ☐ ! CWA's_USA_LCC
  - ☑ ! States_USA_LCC
  - ☐ ! Topo-grey.bmp
  - ☐ ! Topo-brown.bmp
  - ☐ ! Topo-colored.bmp

Table of Contents

- **Unzip all files**
- **Navigate to the directory where you copied the files and then open the 'SVRGIS 2010 update.mxd' file. If files are not copied in the same directory or using an older version of ArcMap, then the data will not display and red exclamation points will be visible next to each data layer in the Table of Contents.**

- Right-click on one of the shapefiles
- Click Properties
- Source tab
- Click Set Data Source
- Navigate to file and click ‘OK’.


SVRGIS 2009 update copy.mxd - ArcMap - ArcView
File Edit View Bookmarks Insert Selection Tools Window Help
1:13,128,597
SVRGIS 1950-2009 severe report data
Tornado_touchdown_points
Tornado_lift_points
Tornado_tracks
EF5
EF4
EF3
EF2
EF1
EF0
Hail_swaths
Hail_2inches_&_greater
Hail
Wind_swaths
Wind_65kts_&_greater
Wind
Cities
Counties_USA_LCC
CWA's_USA_LCC
States_USA_LCC
Topo-grey.bmp
Topo-brown.bmp
Topo-colored.bmp
Display
Source
Selection
Layout
100%
Layer Properties
General
Source
Selection
Display
Symbology
Fields
Definition Query
Labels
Joins & Relates
HTML Popup
Set Data Source...
OK
Cancel
Apply
Data Source
Tornado
Tornado.mdb
Tracks.mdb
EF0.shp
EF1.shp
EF2.shp
EF3.shp
EF4.shp
EF5.shp
Tornado.shp
Tornado_lift_points.shp
Tornado_touchdown_points.shp
Tornado_tracks.shp
Tornado_tracks_junk.shp
Tracks.shp
Add
Cancel
Tools
Drawing
Arial
10

Extent

Top: 3888096.065840 m

Left: -6279239.836415 m

Right: 10841282.153532 m

Bottom: -1835230.783264 m

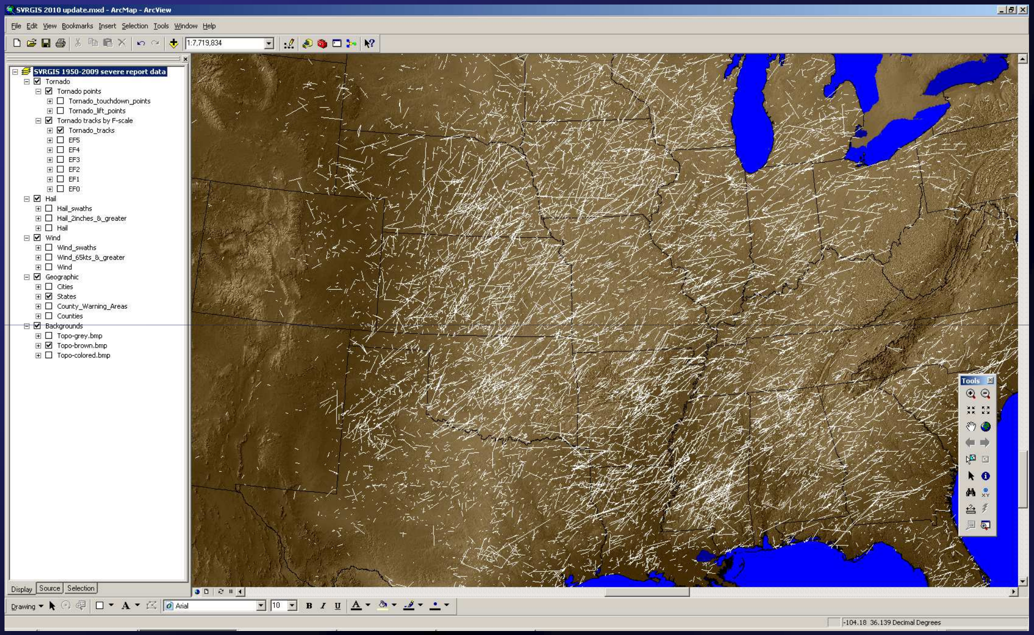
Data Source

Data Type: Shapefile Feature Class
Feature Class: Tornado_touchdown_points_raw_data
Location: H:\SVRGIS\2009 update
Feature Type: Simple
Geometry Type: Point

Name: Tornado_touchdown_points.shp
Show of type: Feature classes

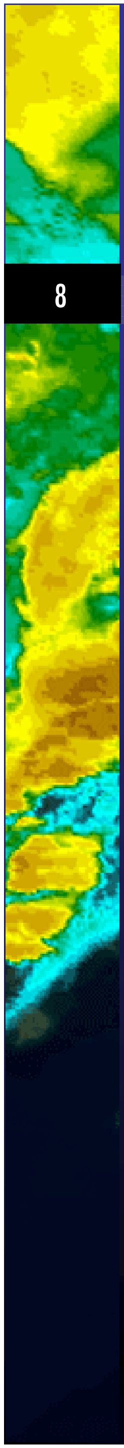
Display the properties of this layer

-126.862 44.529 Decimal Degrees


SVRGIS 2010 update.mxd - ArcMap - ArcView
File Edit View Bookmarks Insert Selection Tools Window Help
1:7,719,834
Tools
Display Source Selection
Drawing
Arial
10
-104.18 36.139 Decimal Degrees

SVRGIS 1950-2009 severe report data
- ☑ Tornado
  - ☑ Tornado points
    - ☐ Tornado_touchdown_points
    - ☐ Tornado_lift_points
  - ☑ Tornado tracks by F-scale
    - ☑ Tornado_tracks
    - ☐ EF5
    - ☐ EF4
    - ☐ EF3
    - ☐ EF2
    - ☐ EF1
    - ☐ EF0
- ☑ Hail
  - ☐ Hail_swaths
  - ☐ Hail_2inches_&_greater
  - ☐ Hail
- ☑ Wind
  - ☐ Wind_swaths
  - ☐ Wind_65kts_&_greater
  - ☐ Wind
- ☑ Geographic
  - ☐ Cities
  - ☑ States
  - ☐ County_Warning_Areas
  - ☐ Counties
- ☑ Backgrounds
  - ☐ Topo-grey.bmp
  - ☑ Topo-brown.bmp
  - ☐ Topo-colored.bmp

- **If ArcMap asks if you would like to build pyramids…answer "yes" as it will take a minute or two to build but it will make navigation faster later.**
- **When the file has opened, it should look like this:**
- **If a blank screen shows up, use the 'Refresh' button to redraw the page.**
- **Uncheck every layer except the following layers:**
  - **Tornado**
    - ***Tornado points***
  - **Tornado tracks by F-scale**
    - ***Tornado_tracks***
  - **Hail**
  - **Wind**
  - **Geographic**
    - ***States***
  - **Backgrounds**
    - ***Topo-brown.bmp***

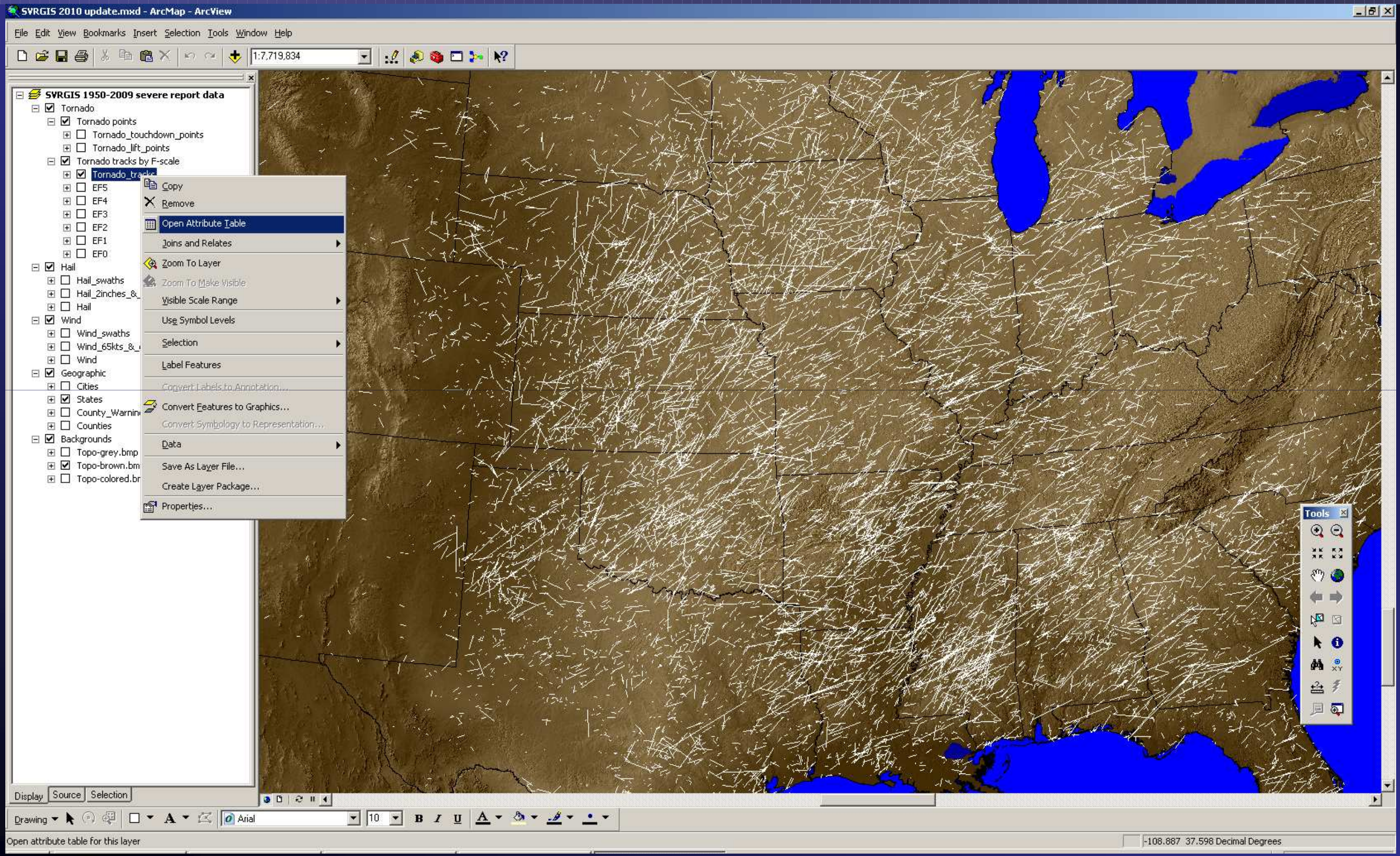


Querying Data

- **Overview**
  - **There will be 3 data query examples presented; the 1st and 2nd examples are based on attribute queries of violent tornadoes and Oklahoma respectively.**
  - **The 3rd example is a spatial query (violent tornadoes ←→ Oklahoma).**
  - **Querying data involves data selection based on a property attribute (e.g., city name, F-scale rating, period of several years) or spatial attribute (e.g., state, county, county warning area)**

Example 1

Attribute Query (violent tornado tracks)


SVRGIS 2010 update.mxd - ArcMap - ArcView
File Edit View Bookmarks Insert Selection Tools Window Help
1:7,719,834
SVRGIS 1950-2009 severe report data
Tornado
Tornado points
Tornado_touchdown_points
Tornado_lift_points
Tornado tracks by F-scale
Tornado_tracks
EF5
EF4
EF3
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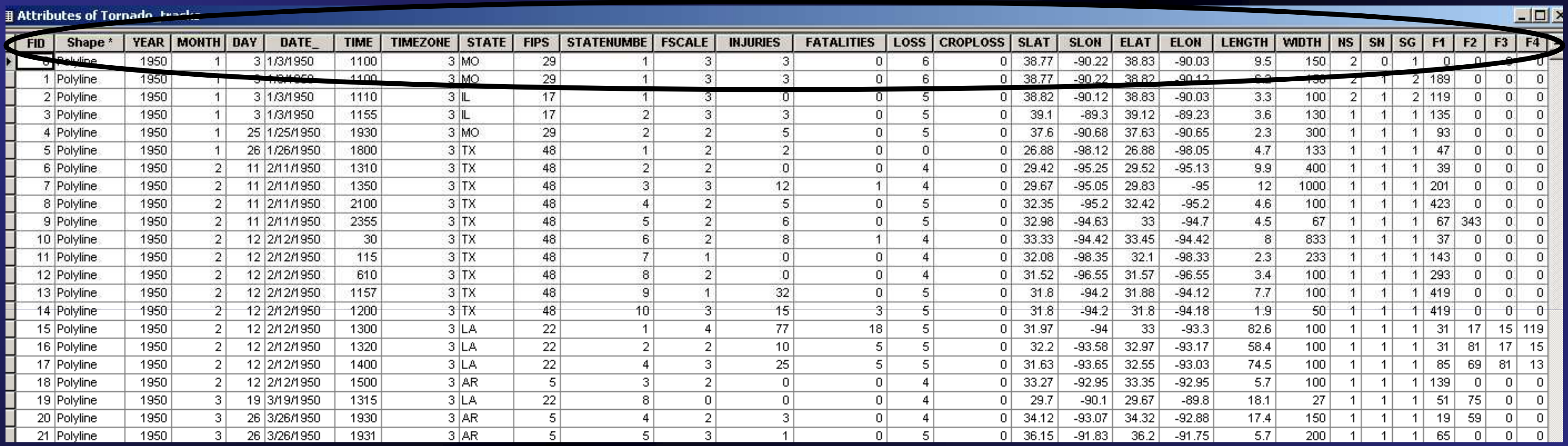
EF1
EF0
Hail
Hail_swaths
Hail_2inches_&_
Hail
Wind
Wind_swaths
Wind_65kts_&_
Wind
Geographic
Cities
States
County_Warnin
Counties
Backgrounds
Topo-grey.bmp
Topo-brown.bm
Topo-colored.br
Copy
Remove
Open Attribute Table
Joins and Relates
Zoom To Layer
Zoom To Make Visible
Visible Scale Range
Use Symbol Levels
Selection
Label Features
Convert Labels to Annotation...
Convert Features to Graphics...
Convert Symbology to Representation...
Data
Save As Layer File...
Create Layer Package...
Properties...
Tools
Display Source Selection
Drawing
Arial
10
Open attribute table for this layer
-108.887 37.598 Decimal Degrees

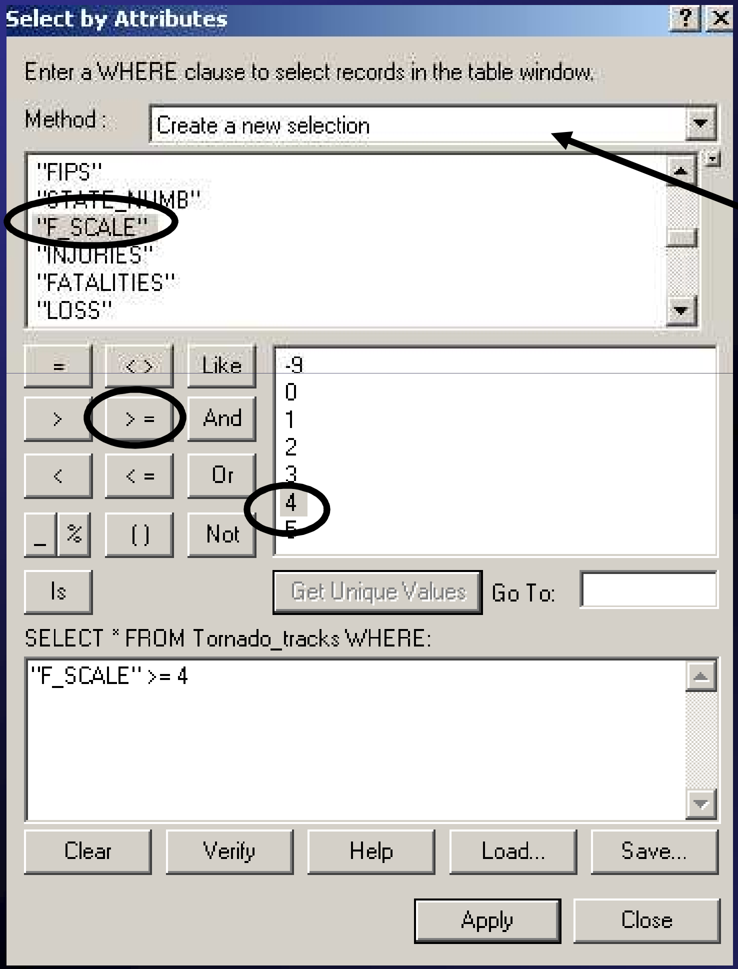
- Turn on the ‘Tornado_tracks’ layer by clicking its box.
- Right-click and click ‘Open Attribute Table’ as shown.



Attributes of Tornado_tracks

FID	Shape *	YEAR	MONTH	DAY	DATE_	TIME	TIMEZONE	STATE	FIPS	STATENUMBE	FSCALE	INJURIES	FATALITIES	LOSS	CROPLOSS	SLAT	SLON	ELAT	ELON	LENGTH	WIDTH	NS	SN	SG	F1	F2	F3	F4
0	Polyline	1950	1	3	1/3/1950	1100	3	MO	29	1	3	3	0	6	0	38.77	-90.22	38.83	-90.03	9.5	150	2	0	1	0	0	0	0
1	Polyline	1950	1	3	1/3/1950	1100	3	MO	29	1	3	3	0	6	0	38.77	-90.22	38.82	-90.12	6.2	150	2	1	2	189	0	0	0
2	Polyline	1950	1	3	1/3/1950	1110	3	IL	17	1	3	0	0	5	0	38.82	-90.12	38.83	-90.03	3.3	100	2	1	2	119	0	0	0
3	Polyline	1950	1	3	1/3/1950	1155	3	IL	17	2	3	3	0	5	0	39.1	-89.3	39.12	-89.23	3.6	130	1	1	1	135	0	0	0
4	Polyline	1950	1	25	1/25/1950	1930	3	MO	29	2	2	5	0	5	0	37.6	-90.68	37.63	-90.65	2.3	300	1	1	1	93	0	0	0
5	Polyline	1950	1	26	1/26/1950	1800	3	TX	48	1	2	2	0	0	0	26.88	-98.12	26.88	-98.05	4.7	133	1	1	1	47	0	0	0
6	Polyline	1950	2	11	2/11/1950	1310	3	TX	48	2	2	0	0	4	0	29.42	-95.25	29.52	-95.13	9.9	400	1	1	1	39	0	0	0
7	Polyline	1950	2	11	2/11/1950	1350	3	TX	48	3	3	12	1	4	0	29.67	-95.05	29.83	-95	12	1000	1	1	1	201	0	0	0
8	Polyline	1950	2	11	2/11/1950	2100	3	TX	48	4	2	5	0	5	0	32.35	-95.2	32.42	-95.2	4.6	100	1	1	1	423	0	0	0
9	Polyline	1950	2	11	2/11/1950	2355	3	TX	48	5	2	6	0	5	0	32.98	-94.63	33	-94.7	4.5	67	1	1	1	67	343	0	0
10	Polyline	1950	2	12	2/12/1950	30	3	TX	48	6	2	8	1	4	0	33.33	-94.42	33.45	-94.42	8	833	1	1	1	37	0	0	0
11	Polyline	1950	2	12	2/12/1950	115	3	TX	48	7	1	0	0	4	0	32.08	-98.35	32.1	-98.33	2.3	233	1	1	1	143	0	0	0
12	Polyline	1950	2	12	2/12/1950	610	3	TX	48	8	2	0	0	4	0	31.52	-96.55	31.57	-96.55	3.4	100	1	1	1	293	0	0	0
13	Polyline	1950	2	12	2/12/1950	1157	3	TX	48	9	1	32	0	5	0	31.8	-94.2	31.88	-94.12	7.7	100	1	1	1	419	0	0	0
14	Polyline	1950	2	12	2/12/1950	1200	3	TX	48	10	3	15	3	5	0	31.8	-94.2	31.8	-94.18	1.9	50	1	1	1	419	0	0	0
15	Polyline	1950	2	12	2/12/1950	1300	3	LA	22	1	4	77	18	5	0	31.97	-94	33	-93.3	82.6	100	1	1	1	31	17	15	119
16	Polyline	1950	2	12	2/12/1950	1320	3	LA	22	2	2	10	5	5	0	32.2	-93.58	32.97	-93.17	58.4	100	1	1	1	31	81	17	15
17	Polyline	1950	2	12	2/12/1950	1400	3	LA	22	4	3	25	5	5	0	31.63	-93.65	32.55	-93.03	74.5	100	1	1	1	85	69	81	13
18	Polyline	1950	2	12	2/12/1950	1500	3	AR	5	3	2	0	0	4	0	33.27	-92.95	33.35	-92.95	5.7	100	1	1	1	139	0	0	0
19	Polyline	1950	3	19	3/19/1950	1315	3	LA	22	8	0	0	0	4	0	29.7	-90.1	29.67	-89.8	18.1	27	1	1	1	51	75	0	0
20	Polyline	1950	3	26	3/26/1950	1930	3	AR	5	4	2	3	0	4	0	34.12	-93.07	34.32	-92.88	17.4	150	1	1	1	19	59	0	0
21	Polyline	1950	3	26	3/26/1950	1931	3	AR	5	5	3	1	0	5	0	36.15	-91.83	36.2	-91.75	5.7	200	1	1	1	65	0	0	0

- **With the attribute table opened, you are able to see the field names or data properties in a tabular format.**



Select by Attributes

Enter a WHERE clause to select records in the table window.

Method : Create a new selection

"FIPS"
"STATE_NUMB"
"F_SCALE"
"INJURIES"
"FATALITIES"
"LOSS"

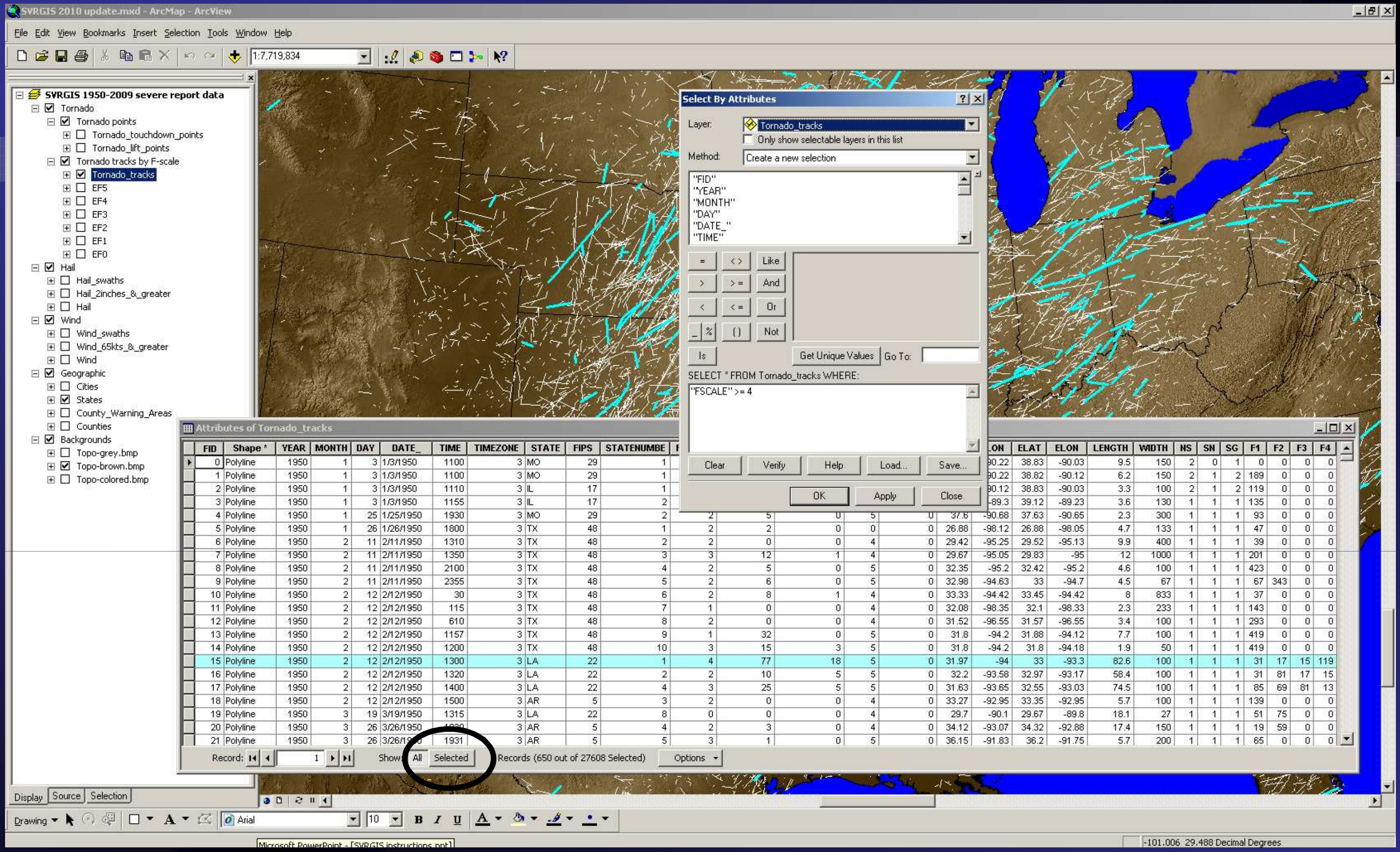
-9
0
1
2
3
4
5

SELECT * FROM Tornado_tracks WHERE:

"F_SCALE" >= 4

=
< >
Like
>
> =
And
<
< =
Or
_
%
( )
Not
Is
Get Unique Values
Go To:
Clear
Verify
Help
Load...
Save...
Apply
Close

- Click ‘Options’ (see above) on the attribute table and click ‘Select by Attributes’
- The ‘Select by Attributes’ window opens, ‘Create a new selection’ (default setting)
- The syntax you will be creating is based on Boolean logic: scroll down and double left click “F_SCALE”
- Click the ‘>=’ *greater than or equal to* symbol
- Click ‘Get Unique Values’ button and a listing of choices will show (in this example: F-9 through F5)
- Double click “F4”
- The Boolean logic statement should read “F_SCALE” >= ‘F4’
- Click ‘Apply’


SVRGIS 2010 update.mxd - ArcMap - ArcView
File Edit View Bookmarks Insert Selection Tools Window Help
1:7,719,834
SVRGIS 1950-2009 severe report data
Tornado
Tornado points
Tornado_touchdown_points
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EF0
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Hail_swaths
Hail_2inches_&_greater
Hail
Wind
Wind_swaths
Wind_65kts_&_greater
Wind
Geographic
Cities
States
County_Warning_Areas
Counties
Backgrounds
Topo-grey.bmp
Topo-brown.bmp
Topo-colored.bmp
Display Source Selection
Select By Attributes
"FID"
"YEAR"
"MONTH"
"DAY"
"DATE_"
"TIME"
=
<>
Like
>
>=
And
<
<=
Or
_ %
()
Not
Is
Get Unique Values
Go To:
Clear
Verify
Help
Load...
Save...
OK
Apply
Close
Options
Drawing
Arial
10
Microsoft PowerPoint - [SVRGIS instructions.ppt]
-101.006 29.488 Decimal Degrees

Layer: Tornado_tracks

☐ Only show selectable layers in this list

Method: Create a new selection

SELECT * FROM Tornado_tracks WHERE:

"FSCALE" >= 4

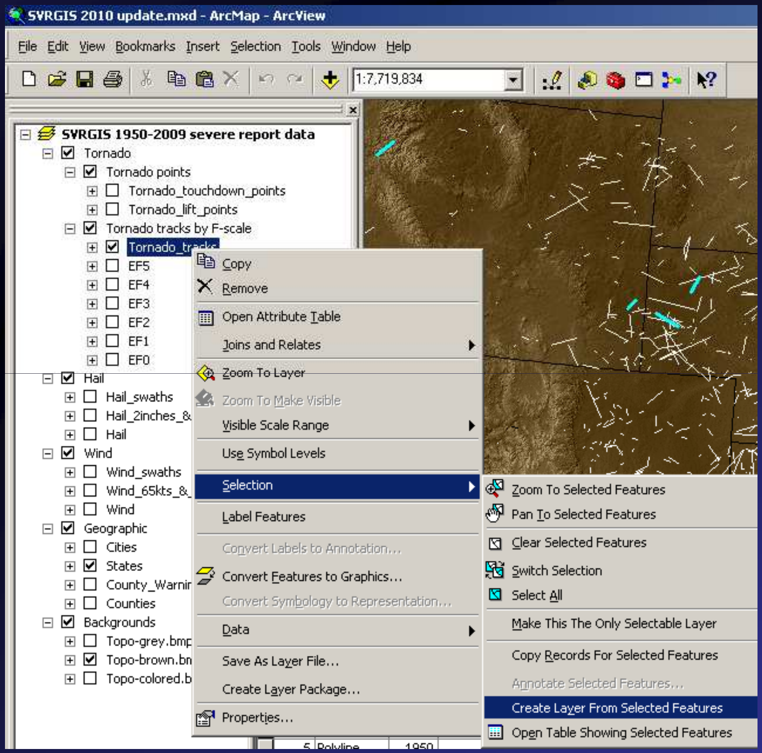
Attributes of Tornado_tracks

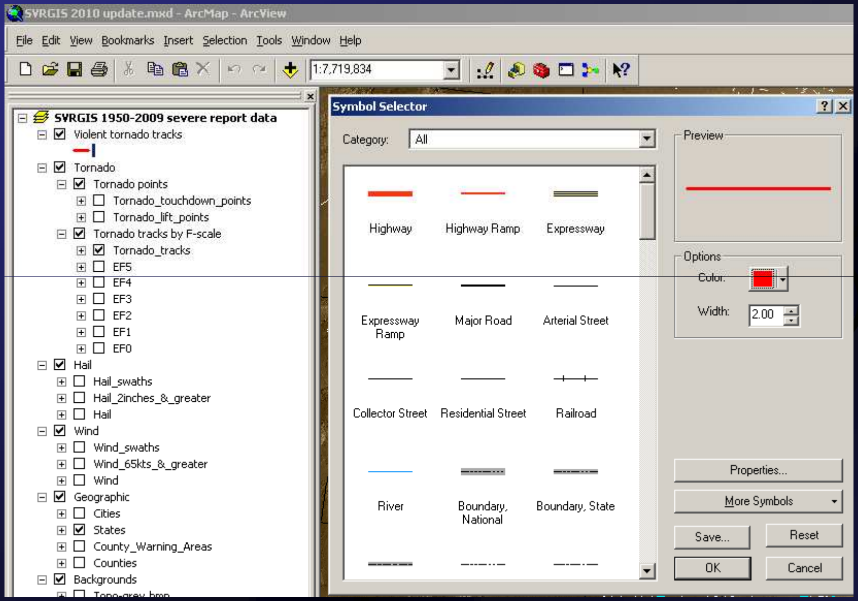
FID	Shape *	YEAR	MONTH	DAY	DATE_	TIME	TIMEZONE	STATE	FIPS	STATENUMBE	F						LON	ELAT	ELON	LENGTH	WIDTH	NS	SN	SG	F1	F2	F3	F4
0	Polyline	1950	1	3	1/3/1950	1100	3	MO	29	1							90.22	38.83	-90.03	9.5	150	2	0	1	0	0	0	0
1	Polyline	1950	1	3	1/3/1950	1100	3	MO	29	1							90.22	38.82	-90.12	6.2	150	2	1	2	189	0	0	0
2	Polyline	1950	1	3	1/3/1950	1110	3	IL	17	1							90.12	38.83	-90.03	3.3	100	2	1	2	119	0	0	0
3	Polyline	1950	1	3	1/3/1950	1155	3	IL	17	2							-89.3	39.12	-89.23	3.6	130	1	1	1	135	0	0	0
4	Polyline	1950	1	25	1/25/1950	1930	3	MO	29	2	2	5	0	5	0	37.6	-90.68	37.63	-90.65	2.3	300	1	1	1	93	0	0	0
5	Polyline	1950	1	26	1/26/1950	1800	3	TX	48	1	2	2	0	0	0	26.88	-98.12	26.88	-98.05	4.7	133	1	1	1	47	0	0	0
6	Polyline	1950	2	11	2/11/1950	1310	3	TX	48	2	2	0	0	4	0	29.42	-95.25	29.52	-95.13	9.9	400	1	1	1	39	0	0	0
7	Polyline	1950	2	11	2/11/1950	1350	3	TX	48	3	3	12	1	4	0	29.67	-95.05	29.83	-95	12	1000	1	1	1	201	0	0	0
8	Polyline	1950	2	11	2/11/1950	2100	3	TX	48	4	2	5	0	5	0	32.35	-95.2	32.42	-95.2	4.6	100	1	1	1	423	0	0	0
9	Polyline	1950	2	11	2/11/1950	2355	3	TX	48	5	2	6	0	5	0	32.98	-94.63	33	-94.7	4.5	67	1	1	1	67	343	0	0
10	Polyline	1950	2	12	2/12/1950	30	3	TX	48	6	2	8	1	4	0	33.33	-94.42	33.45	-94.42	8	833	1	1	1	37	0	0	0
11	Polyline	1950	2	12	2/12/1950	115	3	TX	48	7	1	0	0	4	0	32.08	-98.35	32.1	-98.33	2.3	233	1	1	1	143	0	0	0
12	Polyline	1950	2	12	2/12/1950	610	3	TX	48	8	2	0	0	4	0	31.52	-96.55	31.57	-96.55	3.4	100	1	1	1	293	0	0	0
13	Polyline	1950	2	12	2/12/1950	1157	3	TX	48	9	1	32	0	5	0	31.8	-94.2	31.88	-94.12	7.7	100	1	1	1	419	0	0	0
14	Polyline	1950	2	12	2/12/1950	1200	3	TX	48	10	3	15	3	5	0	31.8	-94.2	31.8	-94.18	1.9	50	1	1	1	419	0	0	0
15	Polyline	1950	2	12	2/12/1950	1300	3	LA	22	1	4	77	18	5	0	31.97	-94	33	-93.3	82.6	100	1	1	1	31	17	15	119
16	Polyline	1950	2	12	2/12/1950	1320	3	LA	22	2	2	10	5	5	0	32.2	-93.58	32.97	-93.17	58.4	100	1	1	1	31	81	17	15
17	Polyline	1950	2	12	2/12/1950	1400	3	LA	22	4	3	25	5	5	0	31.63	-93.65	32.55	-93.03	74.5	100	1	1	1	85	69	81	13
18	Polyline	1950	2	12	2/12/1950	1500	3	AR	5	3	2	0	0	4	0	33.27	-92.95	33.35	-92.95	5.7	100	1	1	1	139	0	0	0
19	Polyline	1950	3	19	3/19/1950	1315	3	LA	22	8	0	0	0	4	0	29.7	-90.1	29.67	-89.8	18.1	27	1	1	1	51	75	0	0
20	Polyline	1950	3	26	3/26/1950	[illegible]	3	AR	5	4	2	3	0	4	0	34.12	-93.07	34.32	-92.88	17.4	150	1	1	1	19	59	0	0
21	Polyline	1950	3	26	3/26/1950	1931	3	AR	5	5	3	1	0	5	0	36.15	-91.83	36.2	-91.75	5.7	200	1	1	1	65	0	0	0

Record: 1 Show: All Selected Records (650 out of 27608 Selected)

- The result are blue highlighted F4 and F5 tornado tracks in the ArcMap display
- Click the ‘Selected’ button on the ‘Attribute Table’ and you will see the tabular form of the selected features (650 out of 27,608 selected), click ‘All’ to see the selected and non-selected records again.
- Close the Attribute Table window

- **Right-click on the ‘Tornado_tracks’ layer, click ‘Selection’, then click ‘Create Layer from Selected Features’**
- **A new layer named ‘Tornado_tracks selection’ is created. To see the newly created layer, please do the following steps.**
- **At the top of ArcMap in the Menubar (see below), click ‘Selection’, ‘Clear Selected Features’**


SVRGIS 2010 update.mxd - ArcMap - ArcView
File Edit View Bookmarks Insert Selection Tools Window Help
1:7,719,834
SVRGIS 1950-2009 severe report data
Tornado
Tornado points
Tornado_touchdown_points
Tornado_lift_points
Tornado tracks by F-scale
Tornado_tracks
EF5
EF4
EF3
EF2
EF1
EF0
Hail
Hail_swaths
Hail_2inches_&
Hail
Wind
Wind_swaths
Wind_65kts_&
Wind
Geographic
Cities
States
County_Warnir
Counties
Backgrounds
Topo-grey.bmp
Topo-brown.bn
Topo-colored.b
Copy
Remove
Open Attribute Table
Joins and Relates
Zoom To Layer
Zoom To Make Visible
Visible Scale Range
Use Symbol Levels
Selection
Label Features
Convert Labels to Annotation...
Convert Features to Graphics...
Convert Symbology to Representation...
Data
Save As Layer File...
Create Layer Package...
Properties...
Zoom To Selected Features
Pan To Selected Features
Clear Selected Features
Switch Selection
Select All
Make This The Only Selectable Layer
Copy Records For Selected Features
Annotate Selected Features...
Create Layer From Selected Features
Open Table Showing Selected Features


SVRGIS 2010 update.mxd - ArcMap - ArcView
File Edit View Bookmarks Insert Selection Tools Window Help
1:7,719,834
SVRGIS 1950-2009 severe report data
☑ Violent tornado tracks
☑ Tornado
☑ Tornado points
☐ Tornado_touchdown_points
☐ Tornado_lift_points
☑ Tornado tracks by F-scale
☑ Tornado_tracks
☐ EF5
☐ EF4
☐ EF3
☐ EF2
☐ EF1
☐ EF0
☑ Hail
☐ Hail_swaths
☐ Hail_2inches_&_greater
☐ Hail
☑ Wind
☐ Wind_swaths
☐ Wind_65kts_&_greater
☐ Wind
☑ Geographic
☐ Cities
☑ States
☐ County_Warning_Areas
☐ Counties
☑ Backgrounds
Symbol Selector
Category: All
Highway
Highway Ramp
Expressway
Expressway Ramp
Major Road
Arterial Street
Collector Street
Residential Street
Railroad
River
Boundary, National
Boundary, State
Preview
Options
Properties...
More Symbols
Save...
Reset
OK
Cancel

Color: 🟥

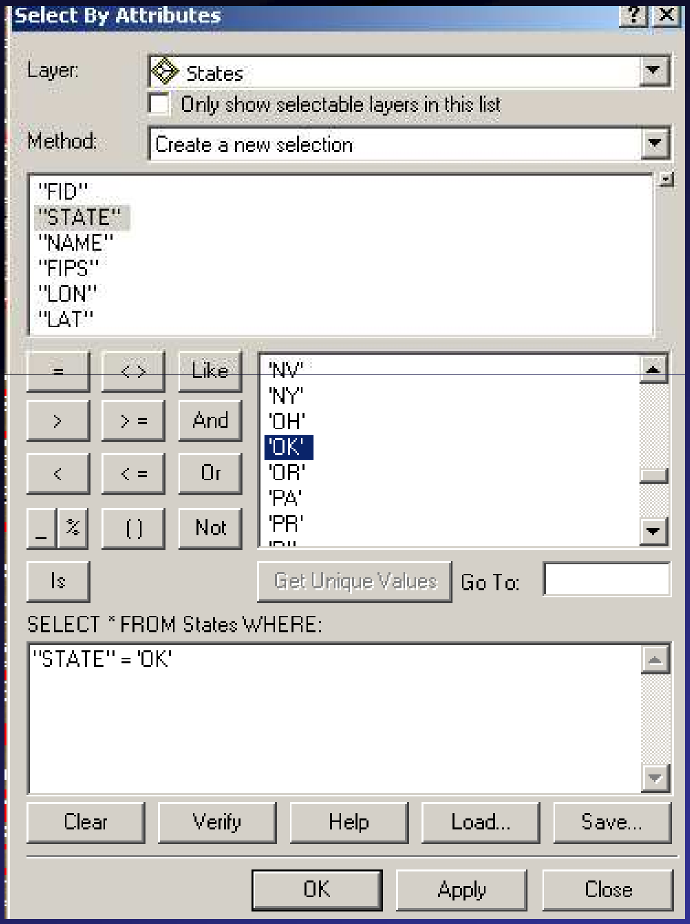
Width: 2.00

- Left-click on the ‘Tornado_tracks selection’ layer and then left-click again slowly
- Rename the layer and type ‘Violent tornadoes’ and then hit ‘Enter’ on the keyboard
- Left-click on the ‘Violent tornadoes’ symbol (small colored line) and a symbol selection menu opens
- Change the ‘Color:’ to Mars Red and the ‘Width:’ to 2, click OK

Example 2

Attribute Query (Oklahoma)

- **Menu bar, click Selection, Select by Attributes…**
- **Select by Attributes table opens, select 'States' (pull down), Create a new selection (pull down), click =, click "Get Unique Values", double click 'OK'.**
  - **Boolean syntax should read, "STATE" = 'OK'**
- **Right-click the 'States' layer and click 'Selection', 'Create Layer From Selected Features'**



Select By Attributes

Layer: States

☐ Only show selectable layers in this list

Method: Create a new selection

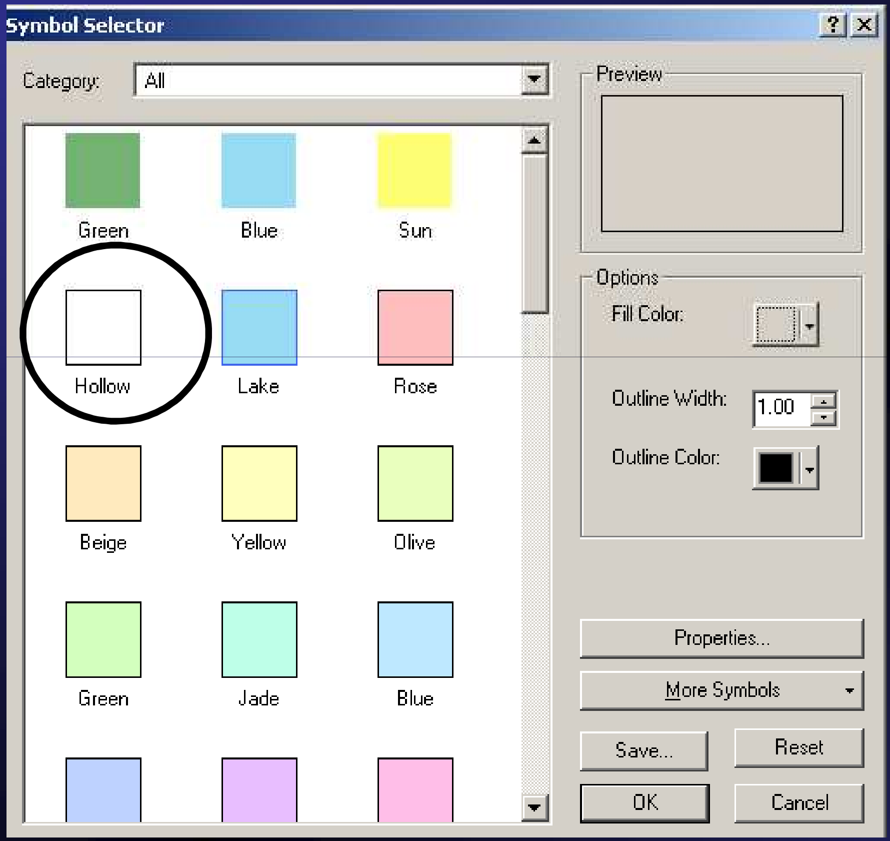
"FID"
"STATE"
"NAME"
"FIPS"
"LON"
"LAT"

'NV'
'NY'
'OH'
'OK'
'OR'
'PA'
'PR'

SELECT * FROM States WHERE:

"STATE" = 'OK'

?
=
<>
Like
>
>=
And
<
<=
Or
_
%
()
Not
Is
Get Unique Values
Go To:
Clear
Verify
Help
Load...
Save...
OK
Apply
Close



Symbol Selector

Category: All

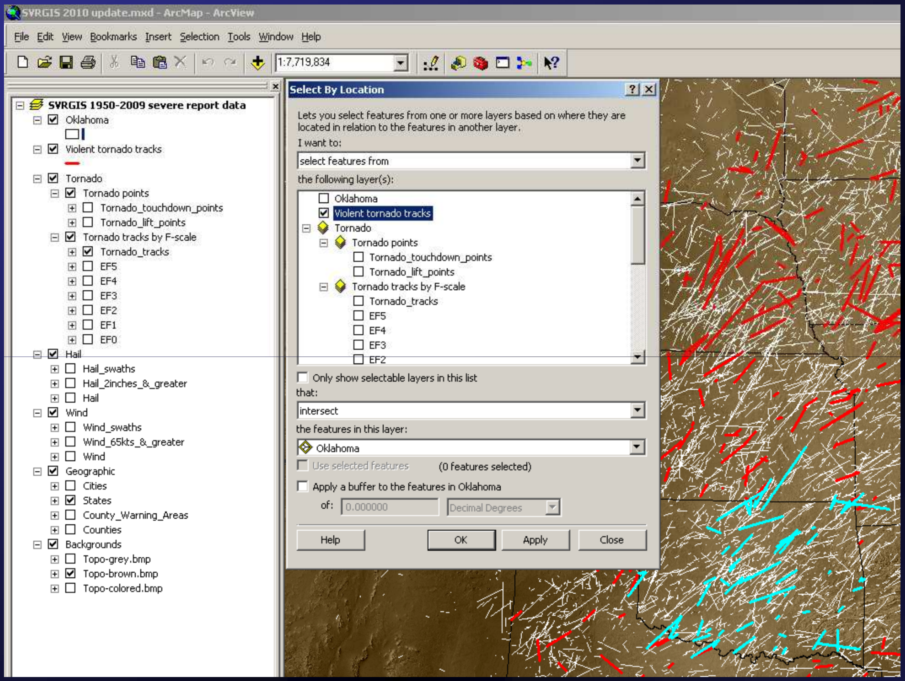
Outline Width: 1.00

Green
Blue
Sun
Hollow
Lake
Rose
Beige
Yellow
Olive
Green
Jade
Blue
Preview
Options
Fill Color:
Outline Color:
Properties...
More Symbols
Save...
Reset
OK
Cancel

- Next, go to the ‘Menubar’ and click ‘Selection’, then click ‘Clear Selected Features’ and the map should look like this…with the new layer named ‘States_selection’ the top most layer
- Rename the ‘States_selection’ layer by clicking the name once, then once more and type ‘Oklahoma’, then hit ‘enter’ on the keyboard
- Change the ‘Oklahoma’ layer by double clicking the symbol beneath Oklahoma, the ‘Symbol Selector’ window will open, select ‘Hollow’ (1st column, 2nd row) and increase the width to ‘1’

Example 3

Spatial Query (Oklahoma violent tornado tracks)


SVRGIS 2010 update.mxd - ArcMap - ArcView
File Edit View Bookmarks Insert Selection Tools Window Help
1:7,719,834
SVRGIS 1950-2009 severe report data
☑ Oklahoma
☑ Violent tornado tracks
☑ Tornado
☑ Tornado points
☐ Tornado_touchdown_points
☐ Tornado_lift_points
☑ Tornado tracks by F-scale
☑ Tornado_tracks
☐ EF5
☐ EF4
☐ EF3
☐ EF2
☐ EF1
☐ EF0
☑ Hail
☐ Hail_swaths
☐ Hail_2inches_&_greater
☐ Hail
☑ Wind
☐ Wind_swaths
☐ Wind_65kts_&_greater
☐ Wind
☑ Geographic
☐ Cities
☑ States
☐ County_Warning_Areas
☐ Counties
☑ Backgrounds
☐ Topo-grey.bmp
☑ Topo-brown.bmp
☐ Topo-colored.bmp

Select By Location

Lets you select features from one or more layers based on where they are located in relation to the features in another layer.

I want to: select features from

the following layer(s):

☐ Oklahoma
☑ Violent tornado tracks
Tornado
Tornado points
☐ Tornado_touchdown_points
☐ Tornado_lift_points
Tornado tracks by F-scale
☐ Tornado_tracks
☐ EF5
☐ EF4
☐ EF3
☐ EF2

☐ Only show selectable layers in this list

that: intersect

the features in this layer: Oklahoma

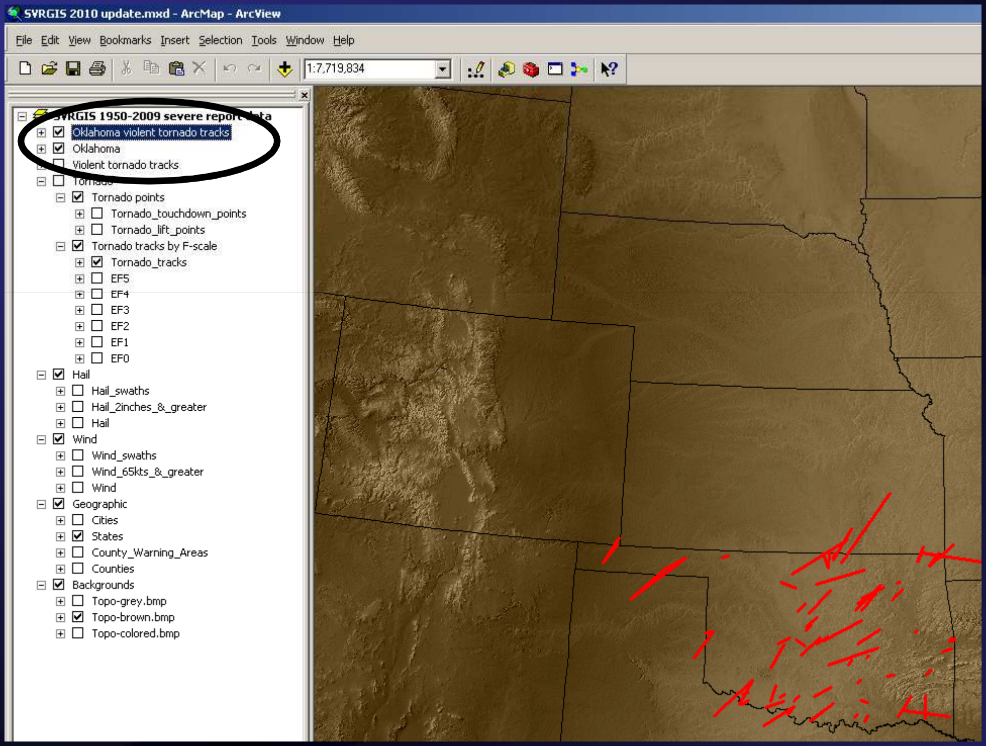
☐ Use selected features (0 features selected)

☐ Apply a buffer to the features in Oklahoma

of: 0.000000 Decimal Degrees

Help
OK
Apply
Close

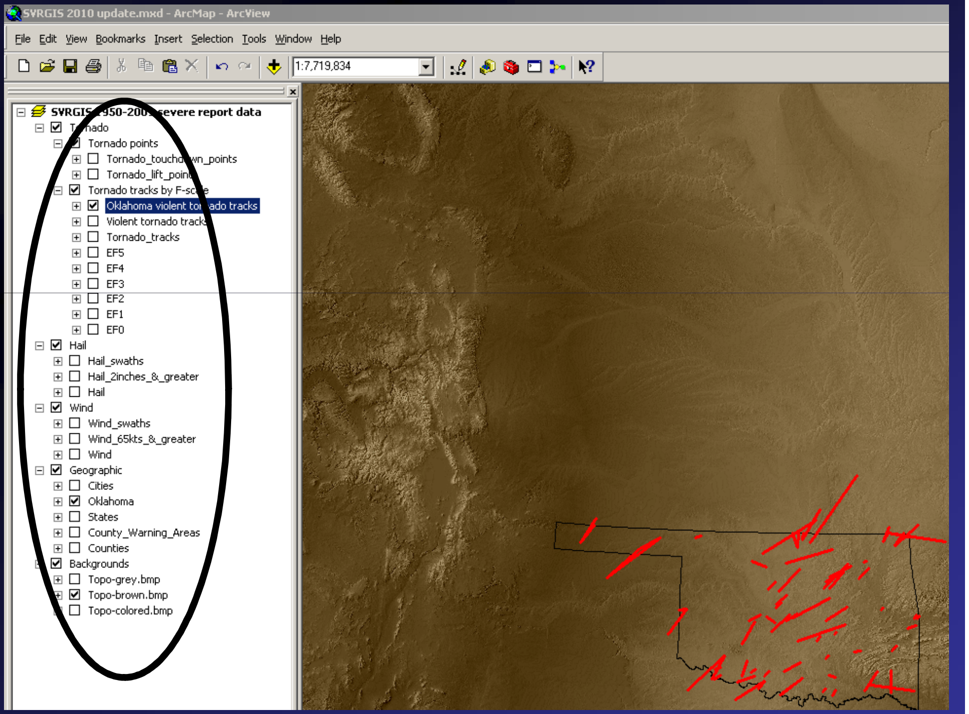
- **At the 'Menubar', Click 'Selection', then click 'Select By Location…' and the 'Select by Location' window opens**
- **In the window, I want to: 'select features from' (pull-down default)**
- **Turn On (check) only 'Violent tornadoes' layer**
- **that: 'intersect' (select this from the pull-down)**
- **the features in this layer: 'Indiana' (select this from the pull-down)**
- **Click the 'Apply' button and close the 'Select by Location' window**
- **Right-click 'Violent tornadoes' layer, click 'Selection', then click 'Create Layer From Selected Features'**


SVRGIS 2010 update.mxd - ArcMap - ArcView
File Edit View Bookmarks Insert Selection Tools Window Help
1:7,719,834
SVRGIS 1950-2009 severe report data
Oklahoma violent tornado tracks
Oklahoma
Violent tornado tracks
Tornado
Tornado points
Tornado_touchdown_points
Tornado_lift_points
Tornado tracks by F-scale
Tornado_tracks
EF5
EF4
EF3
EF2
EF1
EF0
Hail
Hail_swaths
Hail_2inches_&_greater
Hail
Wind
Wind_swaths
Wind_65kts_&_greater
Wind
Geographic
Cities
States
County_Warning_Areas
Counties
Backgrounds
Topo-grey.bmp
Topo-brown.bmp
Topo-colored.bmp

- Rename ‘Violent tornadoes selection’ layer by clicking on the layer’s name then type ‘Oklahoma violent tornado tracks’
- Go to the ‘Menubar’ and click ‘Selection’, then click ‘Clear Selected Features’
- Click on the ‘Oklahoma violent tornado tracks’ symbol and change the color to ‘Mars Red’ and width ‘2’, then click ‘OK’.
- Turn off the ‘Violent tornadoes’ layer and the ‘Tornado_tracks’ layers by ‘unchecking’ the layer to hide them.
  - The violent tornado tracks that have hit Oklahoma since 1950 will become apparent
- Click the ‘–’ and change it to a ‘+’ to hide the symbols to the ‘Oklahoma violent tornado tracks’ layer, ‘Violent tornado tracks’ layer, and ‘Oklahoma’ layer (see inset)

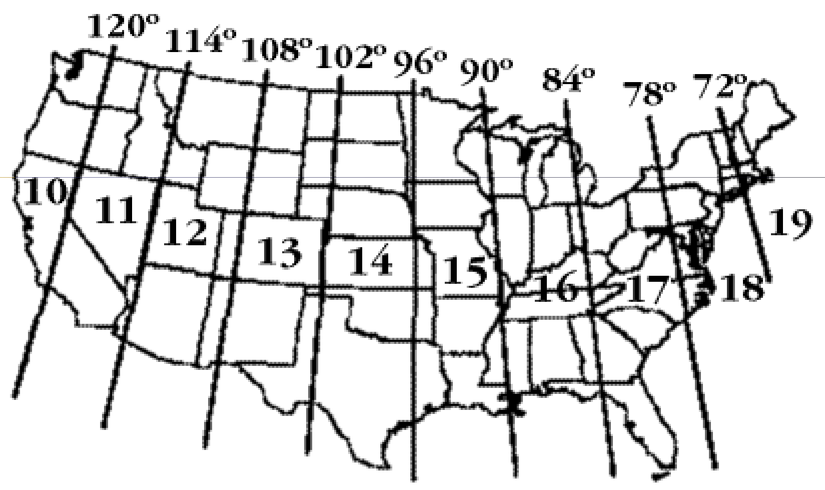
Arranging Layered Data

- In the Table of Contents (listing of layers), left-click and drag the ‘Oklahoma violent tornado tracks’ layer under the ‘Tracks by F-scale’ layer
- Click the ‘–’ and change it to a ‘+’ to hide the ‘Oklahoma violent tornado tracks’ symbol (see inset)
- Left-click and drag the ‘Violent tornado tracks’ layer under the ‘Oklahoma violent tornado tracks’ layer
- Click the ‘–’ and change it to a ‘+’ to hide the ‘Violent tornadoes’ symbol
- Left-click and drag the ‘Oklahoma’ layer under the ‘Geographic’ → ‘Cities’ layer
- Uncheck ‘States’ layer and click the ‘–’ and change it to a ‘+’ to hide the symbol


SVRGIS 2010 update.mxd - ArcMap - ArcView
File Edit View Bookmarks Insert Selection Tools Window Help
1:7,719,834

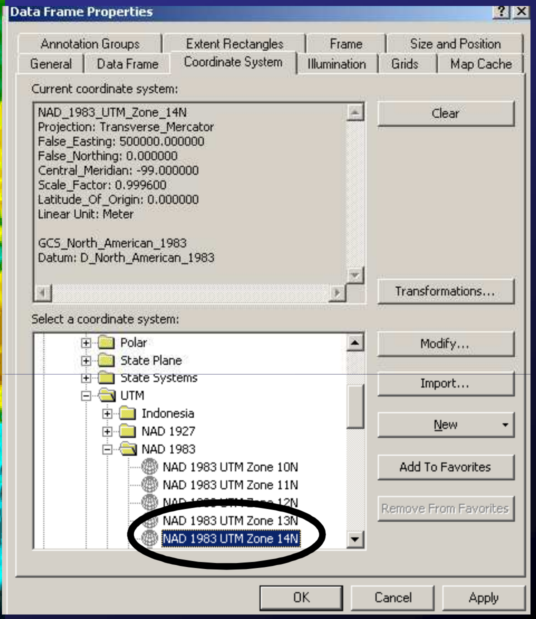
- SVRGIS 950-200 severe report data
  - ☑ T nado
    - ☑ Tornado points
      - ☐ Tornado_touchd wn_points
      - ☐ Tornado_lift_poin
    - ☑ Tornado tracks by F-sc e
      - ☑ Oklahoma violent tor ado tracks
      - ☐ Violent tornado track
      - ☐ Tornado_tracks
      - ☐ EF5
      - ☐ EF4
      - ☐ EF3
      - ☐ EF2
      - ☐ EF1
      - ☐ EF0
  - ☑ Hail
    - ☐ Hail_swaths
    - ☐ Hail_2inches_&_greater
    - ☐ Hail
  - ☑ Wind
    - ☐ Wind_swaths
    - ☐ Wind_65kts_&_greater
    - ☐ Wind
  - ☑ Geographic
    - ☐ Cities
    - ☑ Oklahoma
    - ☐ States
    - ☐ County_Warning_Areas
    - ☐ Counties
  - ☑ Backgrounds
    - ☐ Topo-grey.bmp
    - ☑ Topo-brown.bmp
    - ☐ Topo-colored.bmp

Regionalizing your projection (optional)



UTM Zones in the United States

- Correctly projected data is necessary. The best national projection based on shape is the USA Contiguous Lambert Conformal Conic projection (default). If you want the database projected for a localized region (e.g., state or CWA), use Universal Transverse Mercator (UTM).
- The image shows the UTM Zones in the USA. Choose the zone that your area is mostly within (for Oklahoma, Zone 14N).
- These projection methods of displaying data are recommended if you are tailoring the database to a localized region.


Data Frame Properties
Annotation Groups
Extent Rectangles
Frame
Size and Position
General
Data Frame
Coordinate System
Illumination
Grids
Map Cache
Clear
Transformations...
Modify...
Import...
New
Add To Favorites
Remove From Favorites
OK
Cancel
Apply

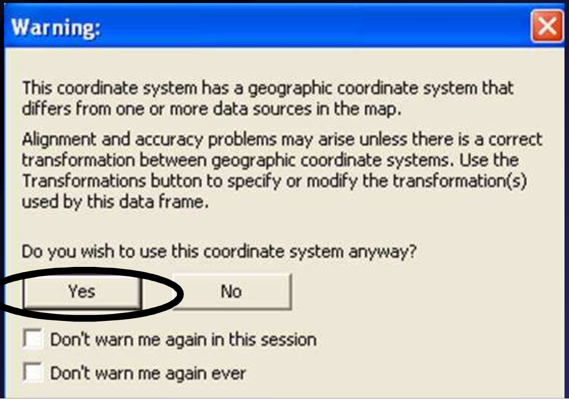
Current coordinate system:

NAD_1983_UTM_Zone_14N
Projection: Transverse_Mercator
False_Easting: 500000.000000
False_Northing: 0.000000
Central_Meridian: -99.000000
Scale_Factor: 0.999600
Latitude_Of_Origin: 0.000000
Linear Unit: Meter

GCS_North_American_1983
Datum: D_North_American_1983

Select a coordinate system:

- Polar
- State Plane
- State Systems
- UTM
  - Indonesia
  - NAD 1927
  - NAD 1983
    - NAD 1983 UTM Zone 10N
    - NAD 1983 UTM Zone 11N
    - NAD 1983 UTM Zone 12N
    - NAD 1983 UTM Zone 13N
    - NAD 1983 UTM Zone 14N


Warning:
Yes
No

This coordinate system has a geographic coordinate system that differs from one or more data sources in the map.

Alignment and accuracy problems may arise unless there is a correct transformation between geographic coordinate systems. Use the Transformations button to specify or modify the transformation(s) used by this data frame.

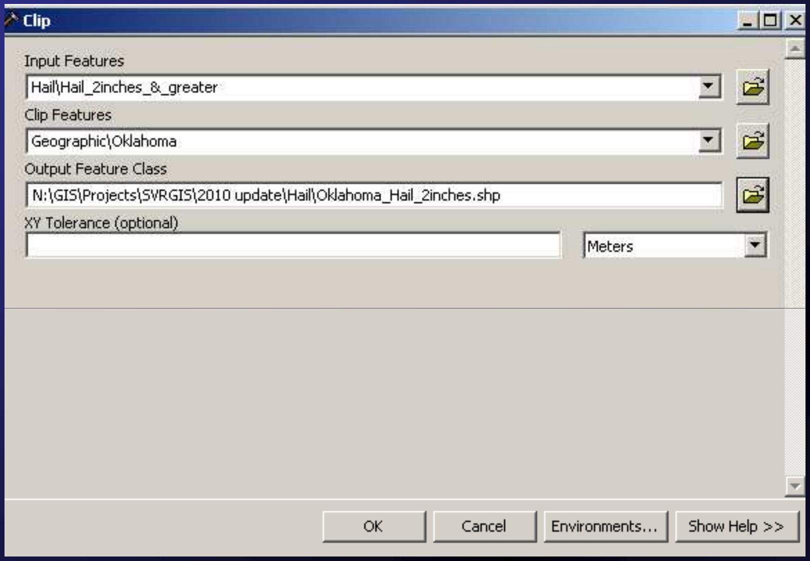
Do you wish to use this coordinate system anyway?

☐ Don't warn me again in this session

☐ Don't warn me again ever

- **Right click on the 'SVRGIS 2009 update' button at the top of the Table of Contents and click the 'Properties' tab. When the Properties dialog box opens, under the Coordinate System tab click Predefined→Projected Coordinate Systems→Utm→NAD 1983→YourZone. Click "OK." If a warning pops up, click "Yes." You are now re-projected.**

Clip tool



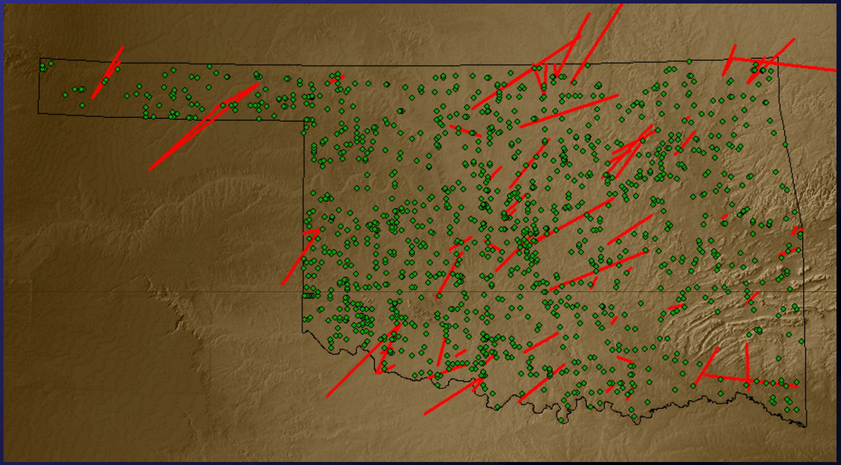
Input Features: Hail\Hail_2inches_&_greater

Clip Features: Geographic\Oklahoma

Output Feature Class: N:\GIS\Projects\SVRGIS\2010 update\Hail\Oklahoma_Hail_2inches.shp

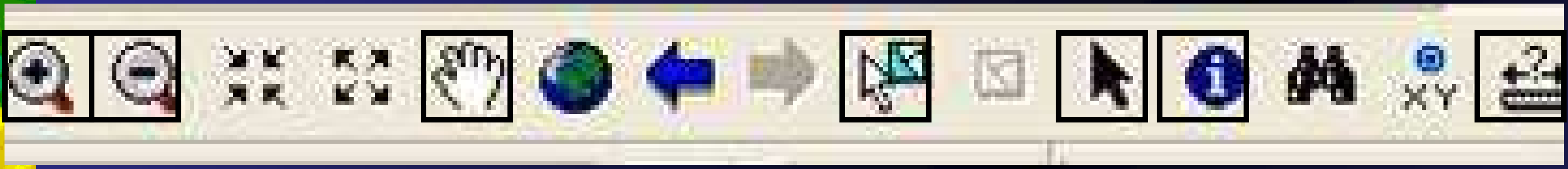
XY Tolerance (optional): Meters

- Clip tool – extracts input features that overlay the clip features
- Click the ArcToolbox icon
- Navigate to ArcToolbox→Analysis Tools→Extract→Clip (2 clicks)
- In the 'Clip' window…
  - *Input Features*
    - *Hail_2inches_&_greater*
  - *Clip Features*
    - *Oklahoma*
  - *Output Feature Class*
    - *Oklahoma_Hail_2inches.shp*
      - *Remember NO spaces in filename!*



- A new ‘Clip’ window opens and displays the scripting process (not shown)
- The script finishes and the 2inches and greater hail reports are arbitrarily displayed as points
  - ‘Check’ the layer to see the data points
- Clipping is yet another way to build a ready-to-use database

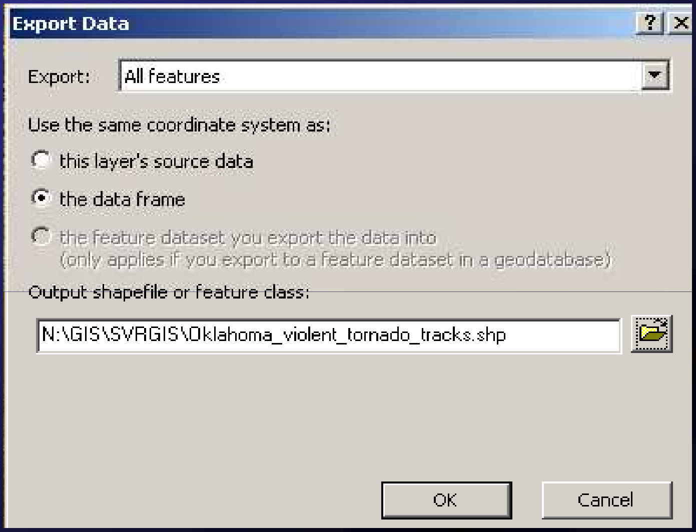
Miscellaneous



- These tools are in the Tools Toolbar and you can make them visible or hide them by clicking the check found by going to the ‘Menubar’, ‘View’, ‘Toolbars’, ‘Tools’ (by default, these will already be displayed).
    - Zoom-in
    - Zoom-out
    - Pan
    - Select features
    - Select elements
    - Identify
    - Measure

Creating shapefiles (.shp)

Oklahoma_violent_tornado_tracks.shp



Export: All features

Use the same coordinate system as:

○ this layer's source data

● the data frame

○ the feature dataset you export the data into
(only applies if you export to a feature dataset in a geodatabase)

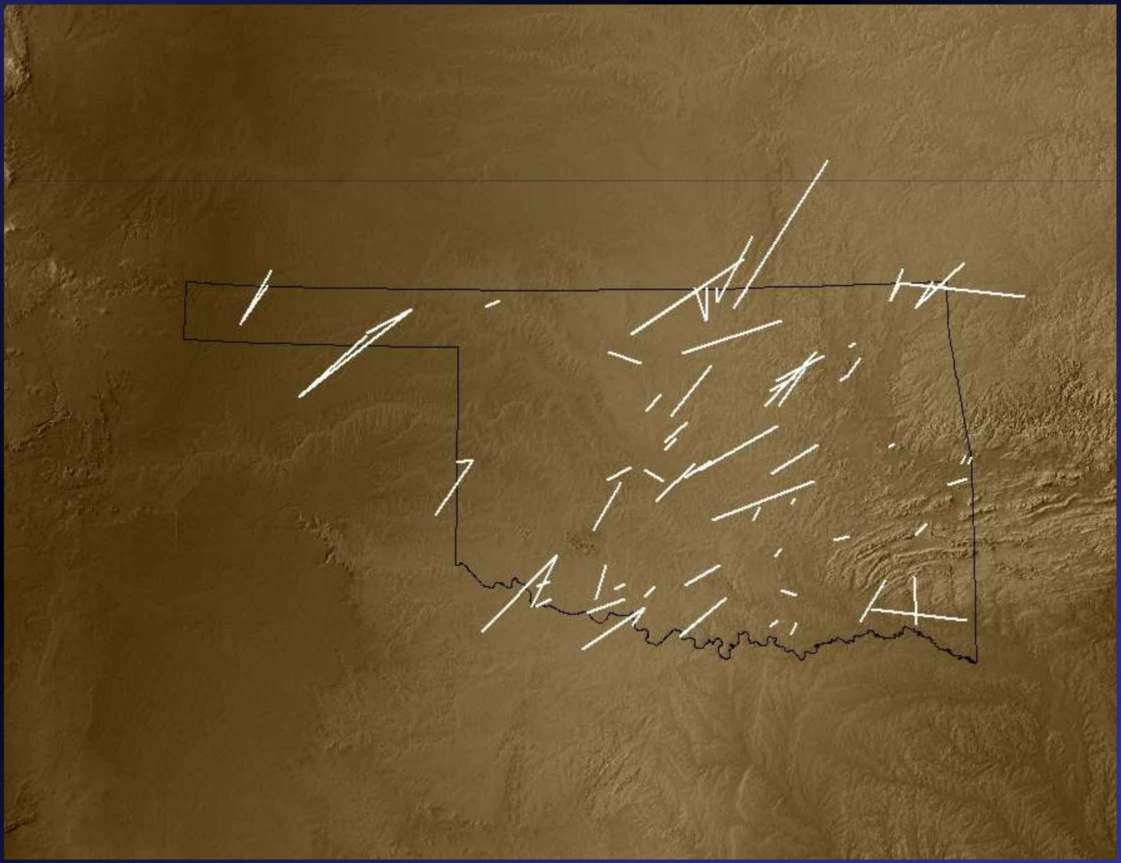
Output shapefile or feature class:

N:\GIS\SVRGIS\Oklahoma_violent_tornado_tracks.shp

- Right-click on a layer, ‘Data’, ‘Export Data…’
- Export: ‘All features’ (drop-down list default)
- Use the same coordinate system as: The ‘Export Data’ window opens, if you would like to make the .shp according to the current projection, click ‘the data frame’
- Specify the directory location and .shp name (do NOT leave spaces in the filename, spaces in the directory name are okay) and click ‘OK’.
- In the window prompt, add the new .shp to the map if you desire.

Creating images

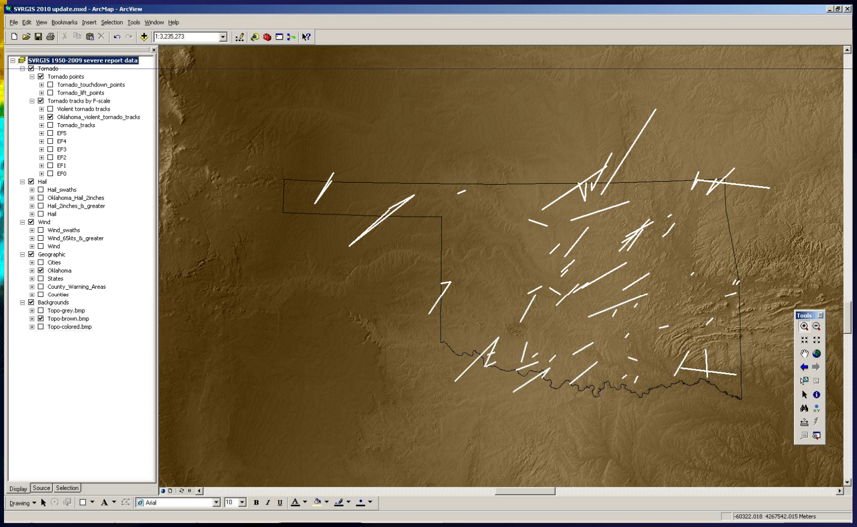
- **At the ‘Menubar’, click ‘File’, then ‘Export Map’ and save with a name and file type (i.e. Oklahoma violent tornado tracks.jpg)**



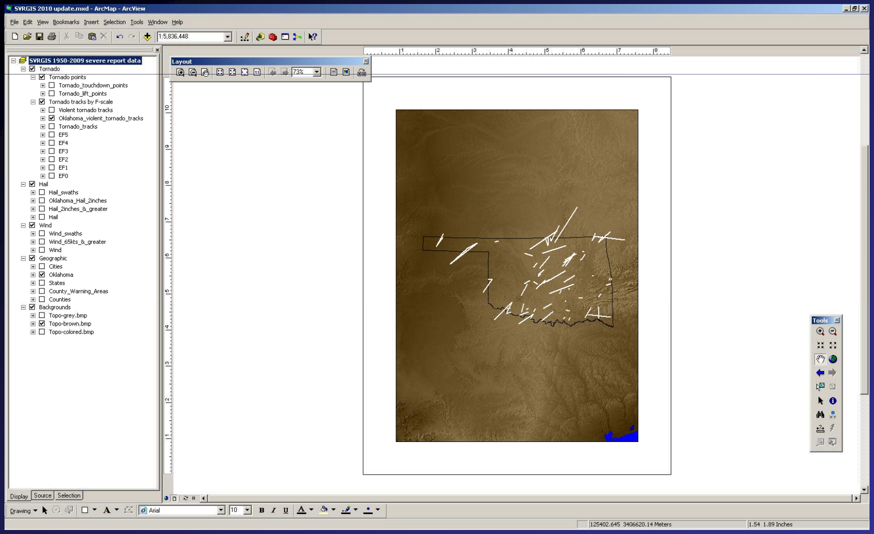
Creating maps

- Navigate in the Menubar to View→Layout View

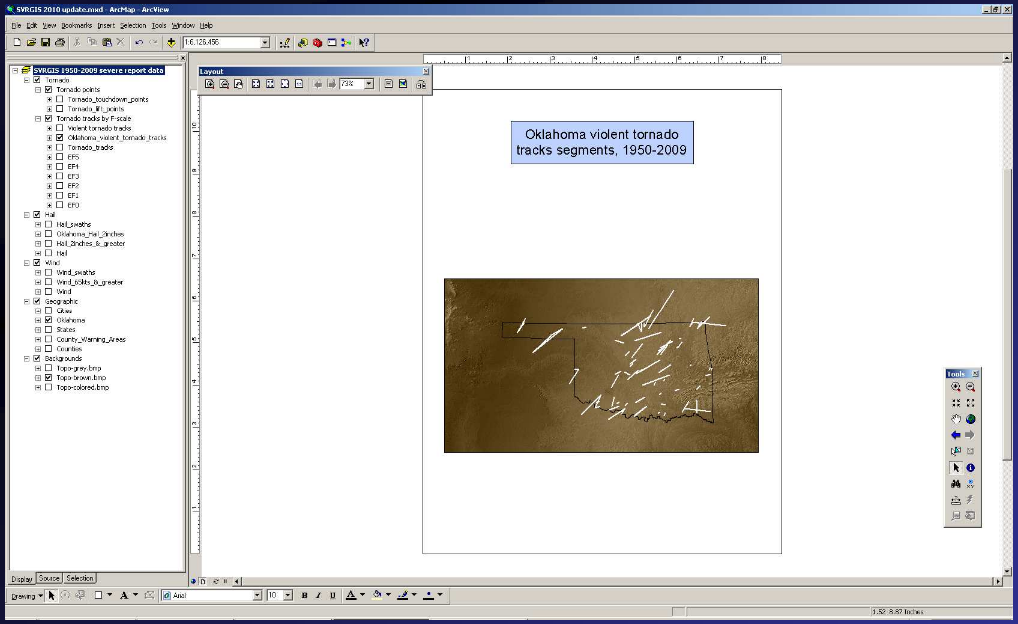
Data View


SVRGIS 2010 update.mxd - ArcMap - ArcView
File Edit View Bookmarks Insert Selection Tools Window Help
SVRGIS 1950-2009 severe report data
Tools

Layout View


SVRGIS 2010 update.mxd - ArcMap - ArcView
File Edit View Bookmarks Insert Selection Tools Window Help
SVRGIS 1950-2009 severe report data
Layout
Tools

- In Layout View, use the ‘Zoom-in’ tool to navigate to Oklahoma
- Use the ‘Select elements’ tool to re-size the SVRGIS 2009 update data frame window
- Insert→Title
  - Double click text box and name accordingly (e.g., Oklahoma violent tornado track segments, 1950-2009)
- With the Title selected, Insert→Neatline
  - A ‘Neatline’ window opens, change the background color as desired and click ‘OK’s


SVRGIS 2010 update.mxd - ArcMap - ArcView
File Edit View Bookmarks Insert Selection Tools Window Help
1:6,126,456
SVRGIS 1950-2009 severe report data
☑ Tornado
☑ Tornado points
☐ Tornado_touchdown_points
☐ Tornado_lift_points
☑ Tornado tracks by F-scale
☐ Violent tornado tracks
☑ Oklahoma_violent_tornado_tracks
☐ Tornado_tracks
☐ EF5
☐ EF4
☐ EF3
☐ EF2
☐ EF1
☐ EF0
☑ Hail
☐ Hail_swaths
☐ Oklahoma_Hail_2inches
☐ Hail_2inches_&_greater
☐ Hail
☑ Wind
☐ Wind_swaths
☐ Wind_65kts_&_greater
☐ Wind
☑ Geographic
☐ Cities
☑ Oklahoma
☐ States
☐ County_Warning_Areas
☐ Counties
☑ Backgrounds
☐ Topo-grey.bmp
☑ Topo-brown.bmp
☐ Topo-colored.bmp
Layout
73%
Oklahoma violent tornado tracks segments, 1950-2009
Tools
Display Source Selection
Drawing
Arial
10
B I U
1.52 8.87 Inches